Displacement Gage | os5100

Preliminary

Applications

- Measurement of displacement between two gage points
- Continuous monitoring of construction joints and crack/fissure growth in rock, concrete, and structural members
- Long-term measurement across key expansion joints in bridges, buildings and tunnels.

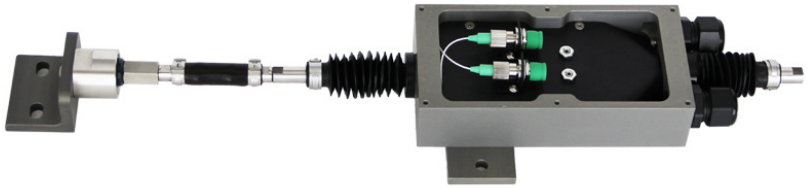
Features

- Rugged aluminum enclosure suitable for outdoor installations
- Qualified to same rigorous standards used for comparable electronic gages
- Designed for simple installation in a variety of applications
- Double ended design supports multiplexing of multiple gages on one fiber
- Fast response time, stable measurements, high resolution
- Fully temperature compensated over entire operating range
- Micron Optics' patented micro opto-mechanical technology
- Integrated junction box protects connectors/splices

Description

Based on fiber Bragg grating (FBG) technology, the os5100 is specifically designed to measure displacement between two gage points on a specimen surface. The gage design is flexible enough to allow for easy attachment to various substrates, making measurements on metal, concrete and other surfaces straightforward. The two FBG sensors that comprise the os5100 gage are located within the rugged hard-coat anodized aluminum enclosure which shields them from the elements and allows for installations in harsh environments.

os5100 Displacement Gage



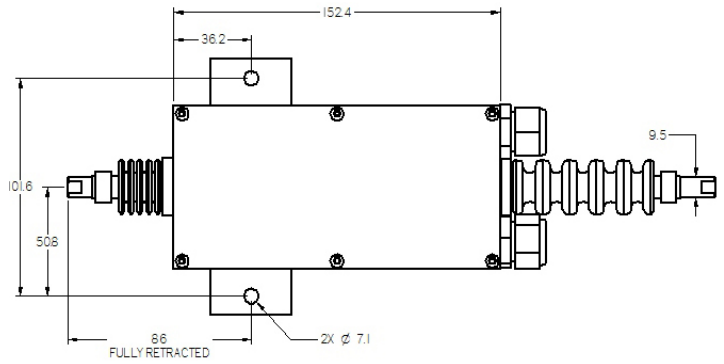
os5100 Displacement Gage with integrated junction box (shown without cover)

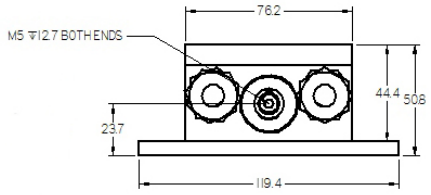
This gage can be used alone or in series as a part of an FBG sensor array (which may include strain and temperature gages, accelerometers and other displacement gages). Cabling for such arrays is much less expensive and cumbersome than comparable electronic gage networks. Cables can be joined directly inside the enclosure, eliminating the need for separate junction boxes. The os5100 delivers the many advantages inherent to all FBG based sensors, including EMI immunity - something vibrating wire gages cannot offer.

With each gage, Micron Optics provides a Sensor Information Sheet listing the gage factor and calibration coefficients needed to convert wavelength information into engineering units. Micron Optics' ENLIGHT Sensing Software provides a utility to calculate and then record, display and transmit data for large networks of sensors. Installation, qualification, mechanical drawings and other sensor information is available at: http://www.micronoptics.com/support_downloads/Sensors/.

Specifications β [1]	os5100
Performance Properties	
Displacement Measurement Range	0 to 50 mm
Accuracy[2]	0.03 mm in steady-state environment
Operating Temperature Range	-40 to 80° C
Water Resistance	IP67 rating
Fatigue Life	10×10^6 cycles at 40 mm stroke
Maximum Speed	1050 mm/sec
Probe Actuation Force	~ 10 N
Physical Properties	
Dimensions	152.4 x 76.2 x 44.5 mm
Weight	1.0 kg
Material	Anodized Aluminum and Stainless Steel
Cable Length	Customer supplied
Cable Type	Terminate inside gage. Gage accepts two cables between 3 to 7 mm diameter
Fastening Method[3]	Bolt-on bracket for sensor body
Optical Properties	
Peak Reflectivity (Rmax)	> 70%
FWHM (-3 dB point)	0.25 nm (± .05 nm; apodized grating)
Isolation	> 15 dB (@ ± 0.4 nm around center wavelength)

Notes:
1. Denotes Beta product. For more details see www.micronoptics.com/product_designation.php.
2. Long term accuracy - 0.5mm based on 300 temperature cycles from -40 to +80°C and 1000 hours of humidity soak at 75°C - 75% relative humidity.
3. See http://www.micronoptics.com/support_downloads/Sensors/ for mechanical drawings and installation details for the os5100 and accessories.
4. Add wavelength tolerance of ±1.5 nm. See the Sensor Information Sheet for more detailed requirements





Ordering Information

os5100-wwww/wwww-xx (Example: os5100-1521/1523-FS)

wwww/wwww: Wavelength Pairs[4] (min/max)

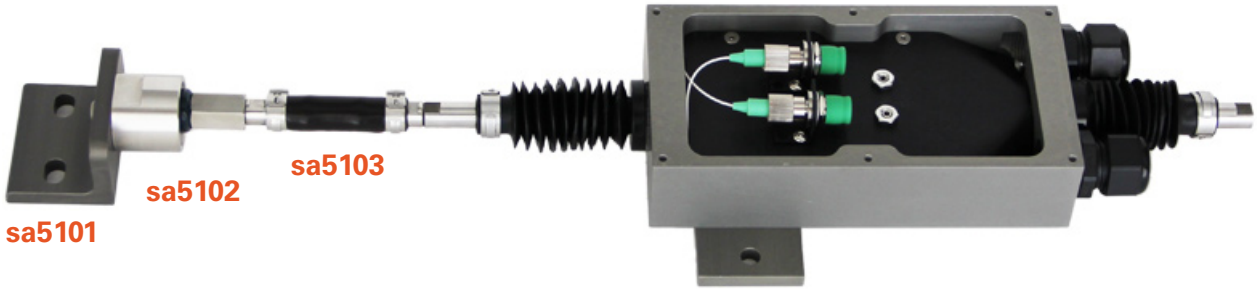
Nominal WL	1521/1523	1536/1538	1551/1553	1566/1568	1581/1583
BW Required	1515-1530	1530-1545	1545-1560	1560-1575	1575-1590

xx: Connection Method

FC FC/APC Connector
FS Fusion Splice

MICRON OPTICS
Micron Optics, Inc.
1852 Century Place NE
Atlanta, GA 30345 USA
phone 404 325 0005
fax 404 325 4082
www.micronoptics.com

Accessories



Angle Bracket Mount - sa5101

The sa5101 Angle Bracket Mount provides convenient, secure attachment of the os5100 gage probe to your structure. Slotted holes in both the base and vertical leg allow alignment during installation.

Safety Disconnect - sa5102

The sa5102 Safety Disconnect is a magnetic breakaway device that helps to protect the os5100 Displacement Gage from damage if there is a risk of exceeding the travel limit. Should the substrates being monitored return within the proper range the sa5102 will automatically reconnect.

Universal Joint - sa5103

The sa5103 Universal Joint compensates for misalignment in the os5100 Displacement Gage and the mount location of the probe. The universal joint has a zero backlash design and will compensate for both angular and offset misalignment. It is ideal for use when the substrate being monitored may not move in a perfectly axial direction to the gage.

sa5101: Angle Bracket Mount Physical Properties	
Probe Mounting	M5 or 10-32 screw
Base Mounting	M6 or 1/4" screws
Weight	53 gms
Material	Aluminum
Finish	Hardcoat anodized
sa5102: Safety Disconnect Physical Properties	
Breakaway Force	50 N
Reattachment Procedure	Automatic
Reattachment Principle	Permanent Magnet
Fastening Method	M5 male/female threads
Weight	107 gms
Material	Stainless Steel
sa5103: Universal Joint Physical Properties	
Angular Misalignment	15° max. recommended
Offset Misalignment	5 mm max. recommended
Maximum Force	100 N
Fastening Method	M5 male/female threads
Weight	34 gms
Material	Stainless Steel and silicone rubber
Lubrication	Permanently lubricated